EXHIBIT G

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(54) Roofing laths and roofs incorporating such laths

(57) A roofing lath, which, in use, supports roof tiles or slates has in its underside 3 a series of transverse openings 1 which allow the cross-flow of ventilating air and/or the drainage of water between the tiles or slates supported by the lath and a waterproofing sheet of felt or plastics material through which the lath is fixed by nails or other fastenings.

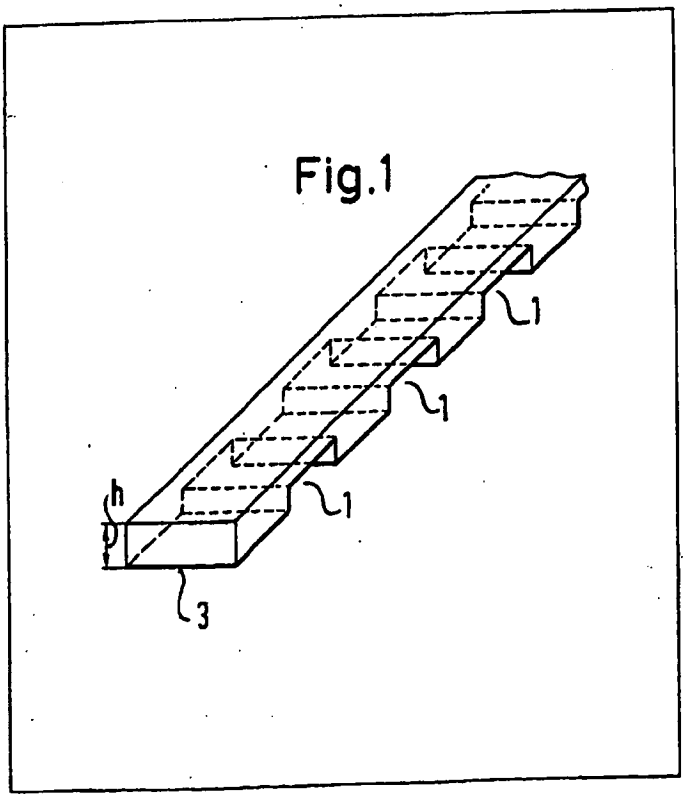

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Fig.1

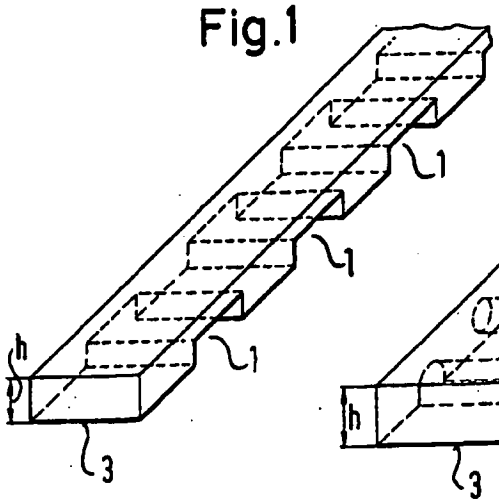


Fig.2

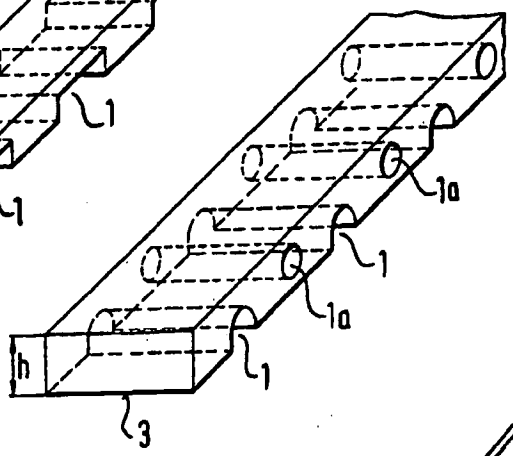


Fig.3

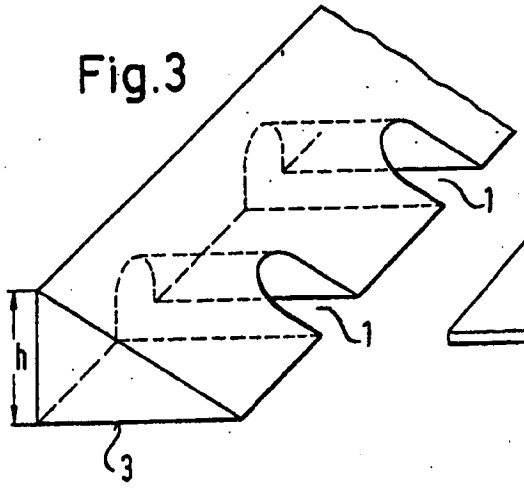


Fig.4

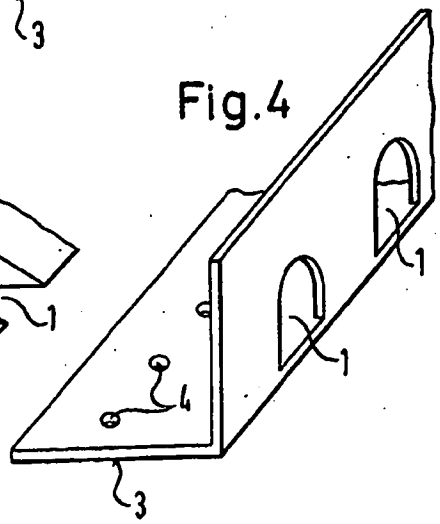


Fig.5

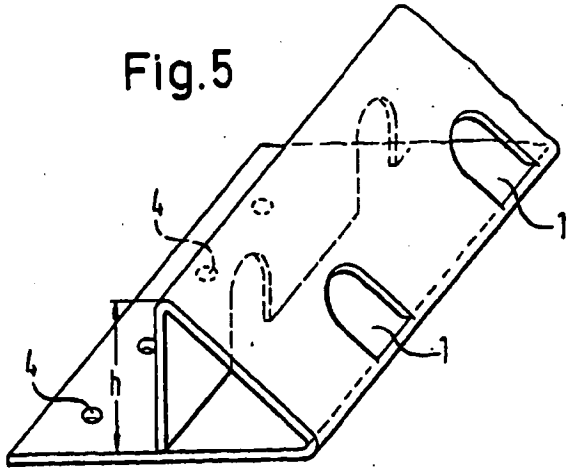


Fig.6

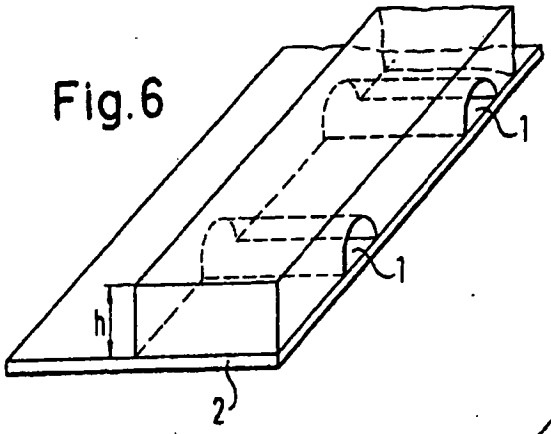


Fig.7

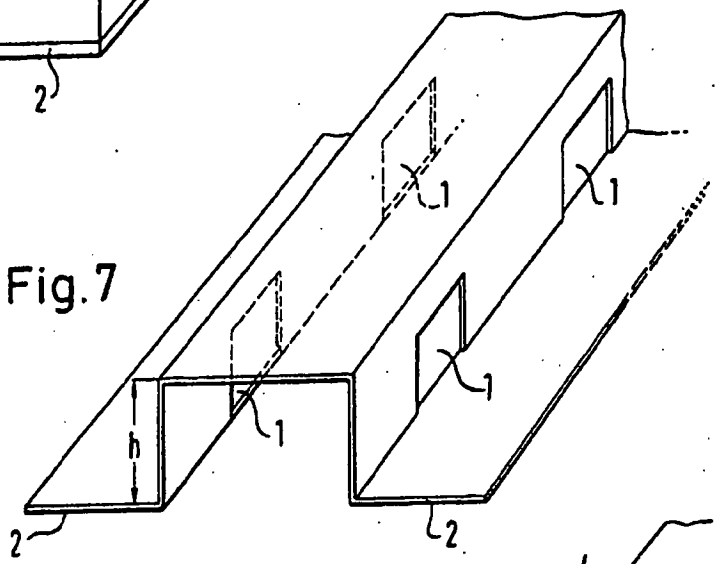
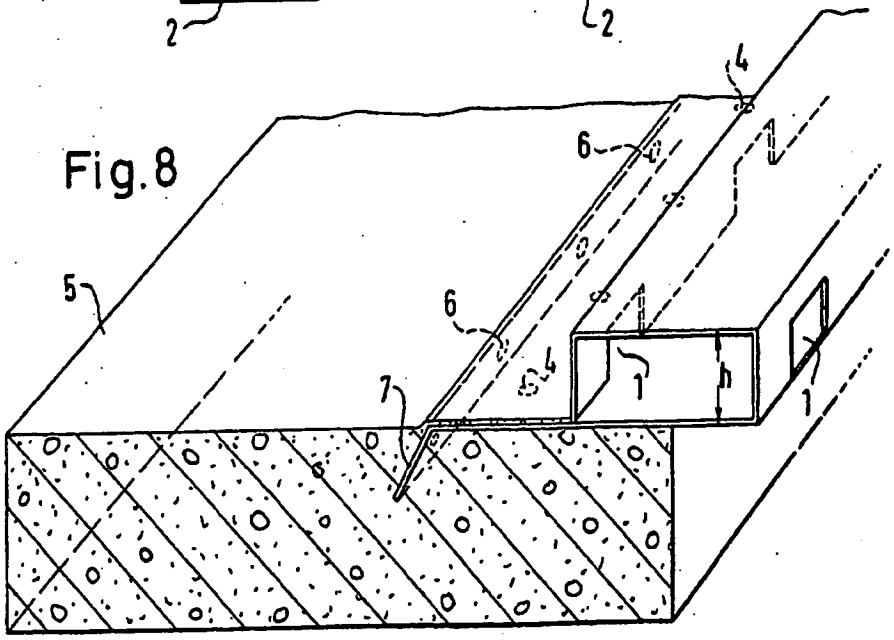


Fig.8



SPECIFICATION

Roofing laths and roofs incorporating such laths

This invention relates to roofing laths for hanging roof tiles or shingles.

In one of the types of roof cladding common today, covering boards are first nailed onto rafters, and over this boarding sheets of waterproof roofing paper, or felt, or plastics sheeting are laid to seal the roof against dust, moisture and drifting snow. This is sometimes followed by espalier lathing which extends at an angle to the roof ridge and then by horizontal roof lathing, on which the roofing tiles or shingles are then hung.

The espalier lathing, which is usually laid perpendicularly to the ridge, allows through ventilation or rear ventilation of the roofing tiles or shingles. The espalier lathing also allows any water that may penetrate the tiles or shingles to drain away under the horizontal lathing without difficulty.

Disadvantages that occur, however, in this form of construction are not only the numerous, different time-consuming operations, which moreover should only be carried out during dry weather, but also the fact that these roofs do not in themselves possess any appreciable insulation against heat or cold.

More recently attempts have been made to fit additional thermal insulation to the roof. Apart from glass fibre insulating mats, ever increasing use is being made of sheets of foamed plastics material, especially polyurethane or polystyrene, the object being to fit these insulating materials not between the rafters but in such a manner that the entire surface of the roof is thermally insulated. Then, however, a new problem arises which is attributable to the plastics foam sheets. This is that, due to the springy nature of the foam sheeting neither the espalier laths nor the horizontal roof laths can be nailed in place in the usual manner. The laths can only be nailed if they are first drilled at those points at which they are to be nailed. In this connection it may be pointed out that on the basis of more recent roofing requirements (see, for example, the thermal insulation regulation that came into force in the Federal Republic of Germany on 1st November 1977), insulating boards or rigid polyurethane foam should be used having a thickness of at least 60mm.

The object of the present invention is to provide a roof lath which makes it possible to dispense with the espalier lathing both in those roofs that are equipped with covering boards and roofing felt or paper or plastics sheeting and also those in which foamed plastic sheets are laid directly on rafters.

According to this invention, a roofing lath for hanging roof tiles or shingles has transverse apertures through it at intervals to allow roof ventilation and to allow water to drain away.

The apertures are preferably situated on the lower face of the roof lath, that is the face which, after the laths have been laid, is towards the rafters or roof boarding, and the apertures simultaneously ensure good ventilation and problem-free drainage away of any water that may penetrate the tiles or shingles. If only good through ventilation is of importance, then the apertures may then be disposed in the centre of the lath or in its upper face. In the latter case, it is only necessary to lay upside down the preferred form of lath, in which the apertures are situated on the lower face.

The cross-section of the apertures is so selected that it complies with architectural requirements. The sum of the cross-sectional areas of the apertures should constitute at least 1/3000 (one three thousandth) of the roof plan area.

The roof lath itself can have any desired form which permits the roofing tiles to be hung safely in accordance with the usual rules. Preferably, the roof laths of this invention have a form which in cross-section constitutes a square or other rectangle, a right-angled triangle, a channel section or an angle section. Depending upon the material from which the roof lath of this invention is manufactured, it can be either solid or tubular and either may be of a material that can be penetrated by nails or have at intervals holes which permit nailing.

According to an especially preferred embodiment of the invention, the roof lath has on its lower face, that is the face which after laying is towards the rafters or roof boarding, a baseplate which is broader than the lath and which either terminates flush with the one longitudinal edge of the lath or projects beyond both longitudinal edges of the lath. Depending upon whether the lath is of a solid material or, for example, of an angle section, the baseplate may form part of the structural cross-section of the lath. If the lath is of channel section, the baseplate may be so arranged that it only projects outwards along both sides, thus forming flanges, so that in cross-section a downwardly open lath is obtained. If the roof lath is hollow and has the cross-sectional form of a rectangle or a right-angled triangle, then the baseplate which projects beyond the lath at one side constitutes the lower face of the roof lath. Holes for nailing the roof lath onto the roof boarding or rafters may then be situated in the projecting portion of the baseplate. The roof boarding may consist of roof covering boards, faced with roofing paper or felt or with plastics sheeting, or may be of foamed plastics sheets laid side by side.

The baseplate may, of course, be fitted subsequently to the lath so that the lath as a whole may then be not of one material but of two different materials.

If the lath is of sheet metal, for example, of cold-rolled galvanized iron strip, then it may preferably be made by continuously or intermittently punching out a strip of metal in such a manner that circular, semi-circular, rectangular or otherwise shaped apertures are obtained at the

desired positions, the holes necessary for nailing-on of the lath being formed simultaneously or in a succeeding operation in the projecting baseplate if this is provided. When this has been done, the metal strip is bent by rolling into the desired cross-sectional form. Sections of this type can, of course, also be produced continuously by extrusion, for example of appropriate aluminium alloys or plastics materials, which if necessary are reinforced by the addition of filler substances, such as glass fibres. The apertures and the holes for nailing are then formed by known techniques, for example by drilling and/or milling.

According to one especially preferred embodiment of the invention, the roof lath of the invention is used for the production of a roof element described in German Offenlegungsschrift 25 32 853, which consists essentially of a plank-shaped base part, especially one of rigid polyurethane foam, and of a bearing lath or ledge for the roof tiles or shingles extending along one entire longitudinal side of the base part, the bearing lath resting upon the upper edge of the base part and projecting beyond this edge. The bearing lath is formed by a roof lath in accordance with the invention. In order to obtain a better fixing to the base part, a baseplate of the lath is bent over and perforated near its edge and this edge penetrates into the foamed base part. The outward projecting baseplate rests beneath a facing, for example a face of aluminium foil, so that water can flow off without coming into contact with the foamed plastics material.

The roof lath of this invention can, of course, also be used in conjunction with other plank-shaped base parts. In this connection, attention is once again drawn expressly to the aforementioned Offenlegungsschrift which also forms a part of the disclosure of the present invention.

The invention further consists, according to another of its aspects, in a roof comprising rafters, waterproof felt or plastics sheeting extending over and between the rafters, laths nailed to the rafters through the felt or sheeting and overlapping tiles on shingles hung on the laths, wherein each lath has transverse apertures through it at intervals to allow roof ventilation and to allow water to drain away.

The laths of the roof may of course include any of the features already described.

Some examples of roofing laths in accordance with the invention are illustrated in the accompanying drawings in which Figures 1 to 8 are perspective views, each of a different example.

Figure 1 shows a first example comprising rectangular transverse apertures. The roofing lath may be of any suitable material, for example wood or plastics. The apertures 1 can be either milled out from the lath, or the lath can be formed by short strips fixed transversely to the longitudinal direction, at intervals with gaps between them, to a continuous lath. The strips then produce the apertures 1 between them.

Figure 2 shows likewise in perspective view part of a roofing lath, in which the apertures 1 are of semi-circular cross-sectional shape or, if they are situated in the centre of the thickness of the lath, are in the form of a bore 1*a*. Both the lath of Figure 1 and also that of Figure 2 are of rectangular cross-section.

Figure 3 shows in perspective view part of a roofing lath comprising apertures 1, and having the cross-sectional shape of a right-angled triangle.

Figure 4 shows part of a roof lath, which has the cross-sectional form of an angle section and, for example, may of an angle iron which, if desired, may be faced with plastics material. The apertures 1 and nailing holes 4 can be seen. The lower face of this lath in practice forms a baseplate.

Figure 5 shows likewise in perspective view part of a roofing lath, which has the cross-sectional shape of a tubular right-angled triangle, the lower face being extended and forming a baseplate projecting at one side. Here again, nail holes 4 and apertures 1 are provided.

Figure 6 shows part of a roofing lath, which for example can be formed by a roof lath according to Figure 1 or Figure 2 fitted on to a baseplate 2. This embodiment can also be made in one piece, for example or an extruded plastics material in which the apertures 1 are formed subsequently.

Figure 7 shows in perspective view a lath which is channel-shaped and downwardly open. A baseplate 2 is formed by two flanges disposed at both sides of the lower face of the lath. This lath, as also the lath shown in Figure 5, can be made by stamping or punching out a sheet metal strip of appropriate width in such a manner that the apertures 1 are obtained and subsequently the sheet metal strip is brought into the desired roof lath form by cold rolling.

Figure 8 shows a roofing lath, which is formed by bending an appropriately shaped metal sheet after previous punching out of the apertures 1. In this example the baseplate projects only at one side beyond the longitudinal edge of the lath and additionally is cranked at its free edge and has, in the cranked side portion 7, holes 6 through which plastics material can penetrate in order to obtain a firm bond between the baseplate and a foamed plastics plank or strip 5. Figure 8 shows a preferred form of the lath for the manufacture of the roof element described in German Offenlegungsschrift No. 25 32 853, in which the roof lath (termed a bearing batten in specification No. 25 32 853) is cantilevered beyond the upper longitudinal edge of the basic lath. The part 5 is preferably of rigid polyurethane foam. Instead of the roof lath illustrated in Figure 8, a lath as shown in Figure 3, which is appropriately cranked, can also be used with a strip 5.

Roofing laths in accordance with the invention can have any desired length, as also can the roof elements as shown in Figure 8, which are formed from the roof lath of this invention. In practice, lengths of 4 metres have proved especially satisfactory. The thickness *h* of the roofing laths is equal to the depth of conventional roof laths, it being generally sufficient for this thickness to be

1.5 to 2.5 cm, depending upon the dimensions of the noses of the tiles or roof shingles.

CLAIMS

1. A roofing lath for hanging roof tiles or roof shingles, the lath having transverse apertures through it at intervals to allow roof ventilation and to allow water to drain away.

2. A lath according to Claim 1, the cross-section of which is a square or other rectangle, a right-angled triangle, a channel section or an angle section.

3. A lath according to Claim 1 or Claim 2, which is solid or tubular and is either of a material that can be penetrated by nails or has nail holes at intervals along it.

4. A lath according to Claim 1, which includes a baseplate at the side of the lath which, after it has been laid, is adjacent rafters or roof boarding, the baseplate being broader than the lath and either terminating flush with one longitudinal edge of the lath or projecting beyond both longitudinal edges of the lath.

5. A lath according to Claim 1, substantially as described with reference to any one of the Figures of the accompanying drawings.

6. A roofing element with an integral lath as described in German Offenlegungsschrift 25 32 853, the lath being in accordance with any one of the preceding Claims.

7. A roof comprising rafters, waterproof felt or plastics sheeting extending over and between the rafters, laths nailed to the rafters through the felt or sheeting and overlapping tiles or shingles hung on the laths, wherein each lath has transverse apertures through it at intervals to allow roof ventilation and to allow water to drain away.

8. A roof according to Claim 7, in which the cross-section of the laths is a square or other rectangle, a right-angled triangle, a channel section or an angle section.

9. A roof according to Claim 7 or Claim 8, in which each lath is solid or tubular and is either of a material that can be penetrated by nails or has nail holes at intervals along it.

10. A roof according to Claim 7, in which each lath includes a baseplate at the side of the lath which is adjacent rafters or roof boarding, the baseplate being broader than the lath and either terminating flush with one longitudinal edge of the lath or projecting beyond both longitudinal edges of the lath.

11. A roof according to Claim 7, in which each lath is substantially as described with reference to any one of the Figures of the accompanying drawings.

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